

REMARKS

This is intended as a full and complete response to the Office Action dated May 16, 2002, having a shortened statutory period for response set to expire on August 16, 2002. Claims 1-10 are pending in the application and stand rejected. Applicants have amended claims 1, 3, 7, and 9, to correct grammatical errors. These amendments to the claims are not directed to patentability. Applicants have also added new claims 11-24 to more clearly recite aspects of the invention. Further, Applicants have proposed a correction to Figure 3, as shown in the attached red-lined copy, to correct an unintentional transcription error. Please reconsider the claims pending in the application for reasons discussed below.

Claims 9-10 stand rejected under 35 U.S.C. § 112, second paragraph. Applicants have amended claim 9 to correct an unintentional error, obviating the rejection. Withdrawal of the rejection is respectfully requested.

Claims 1-3 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Vowles et al.* (U.S. Patent No. 5,076,205) and further in view of *Mokuo* (U.S. Patent No. 6,022,185). The Examiner states that *Vowles et al.* discloses the apparatus substantially as claimed except for the use of a robot having first and second wafer holding arms spaced parallel to each other. The Examiner states that *Mokuo* discloses a "rotatable transferring device including two parallel support arms for the purpose of transferring plural wafers in and out of chambers at the same time to thereby increase throughput." The Examiner, therefore, asserts that it would have been obvious "to have included two support arms in *Vowles et al.* in order to transfer plural wafers in and out of chambers at the same time to increase throughput as taught by *Mokuo*."

Applicants respectfully traverse the rejection. *Vowles et al.* does not disclose the apparatus substantially as claimed. *Vowles et al.* discloses a multi-chamber processing apparatus having individual processing chambers (22, 24, 26, 28, 30) "docked" about a transport mechanism (16,18). The individual processing chambers are mobile (mounted on a frame having casters) to permit exchange of the chambers. Each of the chambers is coupled to the transport mechanism (16, 18) through a valved access port

(32) and a docking mechanism (36). See, *Vowles et al.* at col. 2, line 30 through col. 3, line 16. The docking mechanism (36) includes conduits (70, 72) that are secured together using a quick connect band (79). The docking mechanism (36) also includes locating pins (84) to "accurately align the conduits 70 and 72". (See, *Vowles et al.* at col. 3, lines 50-64.) In addition to not teaching a robot having first and second holding arms spaced parallel to each other as stated by the Examiner, *Vowles et al.* does not teach, show, or suggest a first processing chamber mounted in fixed relation to a transfer chamber and a second processing chamber mounted in adjustable relation to the transfer chamber and to the first chamber, as recited in claims 1-3 and those dependent therefrom. Therefore, *Vowles et al.* does not disclose the apparatus substantially as claimed.

Mokuo discloses a LCD substrate etching process system that includes three process chambers (4a, 4b, 4c) connected to a load lock chamber (2) and a substrate transferring device (1) arranged within the load lock chamber. See, *Mokuo* at col. 2, line 62 through col. 3, line 6 25-52. The transferring device includes two multi-joint expandable arms (20). A support arm (30) is attached to each of the expandable arms and overlap when the expandable arms are retracted. See, *Mokuo* at col. 3, lines 25-52. The first expandable arm is tilted relative to the horizontal plane so that its substrate can be positioned lower than the other substrate positioned on the second expandable arm. See, *Mokuo* at col. 4, lines 34-47. *Mokuo* does not teach, show, or suggest a robot having first and second wafer-holding arms spaced parallel to each other for inserting a pair of wafers simultaneously into the first and second chambers and for placing the wafers accurately centered over the respective platforms, the spacing of the platform centers being adjusted relative to the spacing of the robot arms such that the wafers are centered and placed with a preselected degree of accuracy onto the respective platforms, as recited in claims 1-3 and those dependent therefrom.

Therefore, a combination of *Vowles et al.* and *Mokuo* does not teach, show, or suggest the claimed invention recited in claims 1-3 and those dependent therefrom. Withdrawal of the rejection and allowance of the claims is respectfully requested.

Claims 4-5, 7, and 9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Vowles et al.* and *Mokuo* as applied to claims 1-3 above, and further

in view of *Higashi* (U.S. Patent No. 5,611,861). The Examiner states that *Higashi* teaches "a coupling system comprising [a] bellows assembly and means for securing the relative positions of the plates for the purpose of connecting and disconnecting the valves, allowing communication between each of the process chambers and the transfer chamber in a hermetical sealed fashion." The Examiner, therefore, asserts that it would have been obvious "to have provided a bellows assembly and means for securing the relative positions of the plates in *Vowles et al.* and *Mokuo* in order to connect and disconnect the valves communicating with each of the process chambers and the transfer chamber in a hermetical sealed fashion as taught by *Higashi*."

Applicants respectfully traverse the rejection. *Vowles et al.* and *Mokuo* have been distinguished above. *Higashi* discloses a rotating chamber system whereby each chamber is connectable to a transfer chamber via a bellows system. The bellows system is extendable and retractable along the same plane to engage and disengage the chambers. *Higashi* does not teach, show, or suggest a bellows assembly providing for relative movement between the transfer chamber and the second chamber, as recited in claims 4-10. Therefore, a combination of the references does not teach, show, or suggest the claimed invention. Withdrawal of the rejection and allowance of the claims is respectfully requested.

Claims 6 and 10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Vowles et al.*, *Mokuo* and *Higashi* as applied to claims 4-5, 7, and 9 above, and further in view of *Press* (U.S. Patent No. 4,854,611). The Examiner states that *Press* discloses a bellows assembly comprising a first plate and a second plate with a bellows element sealed therebetween for the purpose of accommodating the "three categories of strain" to which a bellows assembly can be subjected. The Examiner states that *Press* also discloses "means for rigidly fastening in place such position for the purpose of minimizing the possibility of bellows failure in use." The Examiner, therefore, asserts that it would have been obvious "to have provided relative movement in the "X", "Y", and "Z" directions in [*Vowles et al.*, *Mokuo* and *Higashi*] for the purpose of accommodating the three categories of strain... as taught by *Press* and to have provided means for rigidly fastening in place such position in [*Vowles et al.*, *Mokuo* and *Higashi*] for the purpose of minimizing the possibility of bellows failure in use."

Applicants respectfully traverse the rejection. *Vowles et al.*, *Mokuo* and *Higashi* have each been discussed and distinguished above. *Press* discloses a bellows system for connecting fluid transfer piping. There is no motivation or suggestion from within *Press* to have led one having ordinary skill in the art of semiconductor manufacturing to have read the disclosure of *Press*. *Press* is non-analogous art.

Further, the examiner is kindly reminded that *In Re Dembiczak* requires the Examiner to *particularly* identify any suggestion, teaching or motivation from within the references to combine the references. The Examiner must also provide specific findings of the identification of the relevant art, the level of ordinary skill in the art, the nature of the problem to be solved, and any other factual findings that might serve to support a proper obviousness analysis. The mere recitation of a combination of references does not amount to particularly identifying a suggestion, teaching or a motivation to combine the references.

Accordingly, the Examiner has not established a *prima facie* case of obviousness. Notwithstanding, a combination of the references does not teach, show, or suggest the claimed invention. Withdrawal of the rejection and allowance of the claims is respectfully requested.

The prior art made of record is noted. However, it is believed that the secondary references are no more pertinent to the Applicants' disclosure than the primary references cited in the office action. Therefore, it is believed that a detailed discussion of the secondary references is not deemed necessary for a full and complete response to this office action. Accordingly, allowance of the claims is respectfully requested.

In conclusion, the references cited by the Examiner, neither alone nor in combination, teach, show, or suggest the invention as recited in the claims 1-24.

Having addressed all issues set out in the office action, applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



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APPENDIX

1. (Amended) Apparatus for processing multiple semiconductor wafers, the apparatus comprising:

a transfer chamber;

a first [or master] processing chamber mounted in fixed relation to the transfer chamber and having a first wafer-holding platform with a center;

a second processing chamber mounted in adjustable relation to the transfer chamber and to the first chamber and having a second wafer-holding platform with a center; and

a robot rotatably mounted within the transfer chamber and having first and second wafer-holding arms spaced parallel to each other for inserting a pair of wafers simultaneously into the first and second chambers and for placing the wafers accurately centered over the respective platforms, the spacing [being adjusted] is adjustable relative to the spacing of the robot arms such that the wafers are centered and placed with a preselected degree of accuracy onto the respective platforms for efficient processing of the wafers.

3. (Amended) Apparatus for processing multiple semiconductor wafers, the apparatus comprising:

a transfer chamber;

a first processing chamber mounted in known relation to the transfer chamber and having a first wafer-holding platform with a center;

a second processing chamber having a second wafer-holding platform with a center;

a mechanism for adjustably mounting the second chamber in relation to the first chamber and to the transfer chamber, the mechanism providing a plurality of position adjustments for the second chamber; and

a robot rotatably mounted within the transfer chamber and having first and second wafer-holding arms spaced parallel to each other for inserting a pair of wafers simultaneously into the first and second chambers and for placing the wafers accurately

centered over the respective platforms, the spacing of the platform centers [being adjusted] is adjustable relative to the spacing of the robot arms such that the wafers are centered and placed with a preselected degree of accuracy onto the respective platforms for efficient processing of the wafers.

7. (Amended) Apparatus for processing at least two semiconductor wafers simultaneously, the apparatus comprising:

- a transfer chamber;
- a load-lock chamber adjacent the transfer chamber;
- a first processing chamber mounted in known relation to the transfer chamber and having a first wafer-holding platform with a center;
- a second processing chamber having a second wafer-holding platform with a center;

adjusting means for adjustably mounting the second chamber in relation to the first chamber and to the transfer chamber, the adjusting means having a bellows assembly positioned between the transfer chamber and the second chamber and providing for relative movement thereof and also providing a wafer passageway between the chambers while maintaining an hermetic seal; and

a robot rotatably mounted around a center axis within the transfer chamber and having [a] first and second wafer-holding arms spaced parallel to each other for withdrawing a pair of wafers from the load-lock chamber and inserting the pair of wafers simultaneously into the first and second chambers and for positioning both of the wafers with a preselected degree of accuracy over the respective platforms, the spacing of the platform centers [being adjusted] is adjustable to the preselected degree of accuracy by the adjusting means relative to each other and to the spacing of the robot arms and the center axis such that the wafers are centered and placed with the preselected degree of accuracy onto the respective platforms for efficient processing of the wafers.

9. (Amended) Apparatus for processing a pair of semiconductor wafers simultaneously, the apparatus comprising:

- a transfer chamber;

a load-lock chamber adjacent the transfer chamber;

a first processing chamber mounted in fixed relation to the transfer chamber and having a first wafer-holding platform with a center;

a second processing chamber having a second wafer-holding platform with a center;

mechanical means for adjustably mounting the second chamber in relation to the first chamber and to the transfer chamber; the mechanical means supporting the second chamber against the [load-lock] transfer chamber in cantilever fashion and having a bellows assembly positioned between the transfer chamber and the second chamber to provide for relative movement thereof and to provide a wafer passageway between the respective chambers while maintaining an hermetic seal;

a slit valve adjacent the passageway for hermetically sealing the transfer chamber from the second chamber; and

a remotely controlled robot rotatably mounted around a center axis within the transfer chamber and having first and second wafer-holding arms spaced parallel to each other for withdrawing a pair of wafers from the load-lock chamber and inserting the pair of wafers simultaneously into the first and second chambers and for positioning both of the wafers to a preselected degree of accuracy over the respective platforms, the spacing of the platform centers [being adjusted] is adjustable by the mechanical means relative to each other and to the spacing of the robot arms and the center axis such that the wafers are centered and placed with the preselected degree of accuracy onto the respective platforms for efficient processing of the wafers.